

ICE-30™ 3001 MCU IN-CIRCUIT EMULATOR

Extends the Inteltec® diagnostic capabilities into user configured systems, allowing in-circuit emulation of the user system's 3001 MCU

Direct Inteltec® System connection to the user configured system is achieved via an external cable with 3001 compatible 40-pin connector

Provides for the display of all 3001 address, status, and control lines for the current micro-instruction executed.

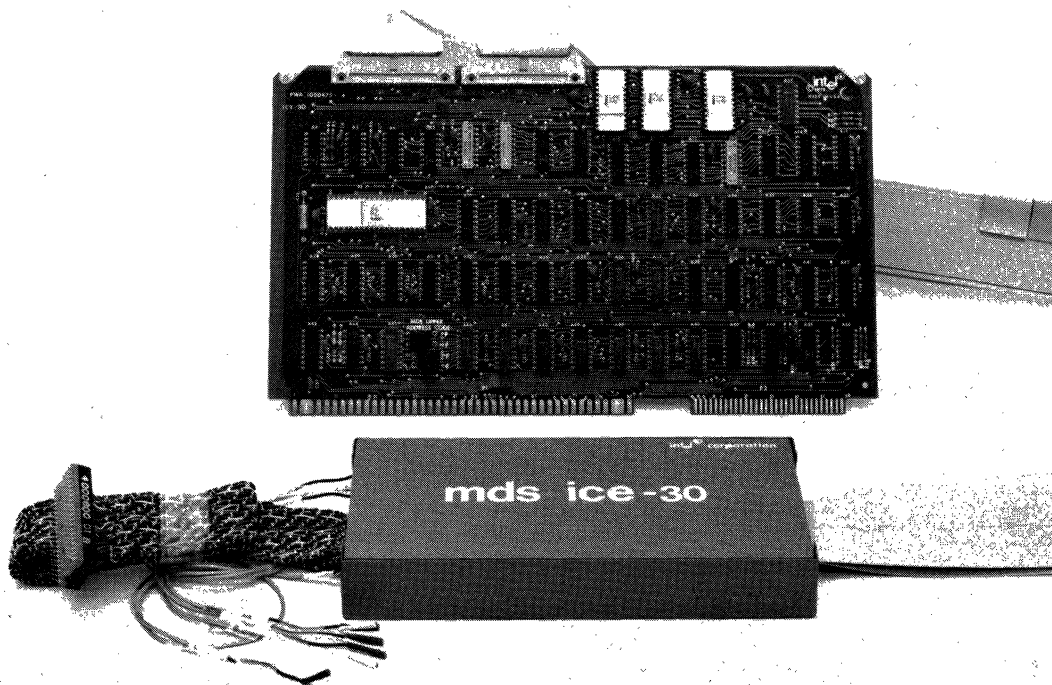
Allows for single-step microprogram execution

Presets the 9-bit 3001 Microprogram Address Register and sets two independent breakpoints on micro-instruction addresses generated by the 3001

Allows two independent breakpoints to be set on the logical combination of any three TTL compatible signals in the user system via three logic probes

Allows the microprogram word contents to be displayed and modified when used with the optional ROM-SIM modules

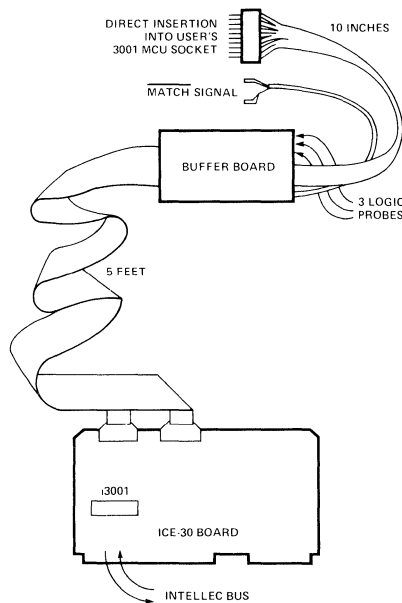
ICE-30 is an Inteltec resident module that provides the user with direct in-circuit emulation of the 3001 Microprogram Control Unit (MCU) and complete control over the execution of user developed microprograms. Through in-circuit emulation, the designer is able to set microprogram address breakpoints, single-step microprogram execution, and monitor all of the address, status, and control lines of the 3001.



HARDWARE

ICE-30 consists of a single PC board that resides in the Intellec System. An external cable from the board, terminating in a 3001 compatible 40-pin connector, forms the interface to the user system. Through the 3001 compatible connector, ICE-30 plugs directly into the user system's 3001 socket and allows the user to completely monitor and control all the activities of the MCU.

The figure below shows the hardware supplied with the ICE-30 package.



ICE-30 MODULE HARDWARE

By inserting the board into the Intellec Bus inside a basic Intellec system, a 3001 MCU chip in the user's system may be emulated. The ICE-30 board contains a 3001 MCU and peripheral logic required to monitor the 3001 operation and store trace information. The external cable carries status and control lines to and from the 3001 compatible 40-pin connector and the three logic probe lines. In addition, a MATCH line is brought out on the external cable which allows ICE-30 to control the user system's master clock and perform microprogram halt and single-step functions.

SOFTWARE

The ICE-30 Software Driver, ICE30SD, is an Intellec Microcomputer Development System RAM-resident program which provides a user interface with the ICE-30

hardware. ICE30 recognizes a set of commands issued by the user, translates the commands, and places the encoded results into a control block for the hardware. In this fashion, the user can establish a dialogue with the 3001 Microcomputer Control Unit (MCU) which is connected to the system, thus providing the capability to monitor, control or alter its operation.

ICE30 is capable of operating in conjunction with a RAM-based microprogram in the optional ROM-SIM modules (see ROM-SIM Data Sheet #98-211A). The commands provided by ICE30SD may therefore be divided into three categories: (1) Those commands unique to the optional ROM simulator, (2) Those which support ICE30SD functions, and (3) Those commands which are common to both ROM-SIM and ICE30SD.

ICE30 FUNCTION COMMANDS

SET	Assign values to the two hardware breakpoint registers, the 9-bit microprogram address register, and the PR latch.
GO	Initiates real-time emulation which continues until an address encountered matches one of the two breakpoint values.
STEP	Causes execution to proceed in a non-real-time single-step micro-instruction mode.
CONTINUE	Resumes step mode execution following a break condition.
ENABLE	Activates or deactivates the two hardware breakpoint registers prior to issuing the 'GO' command.
TRAP	Used to set or remove any of the five-step mode software traps (software breakpoint registers).

COMMON COMMANDS

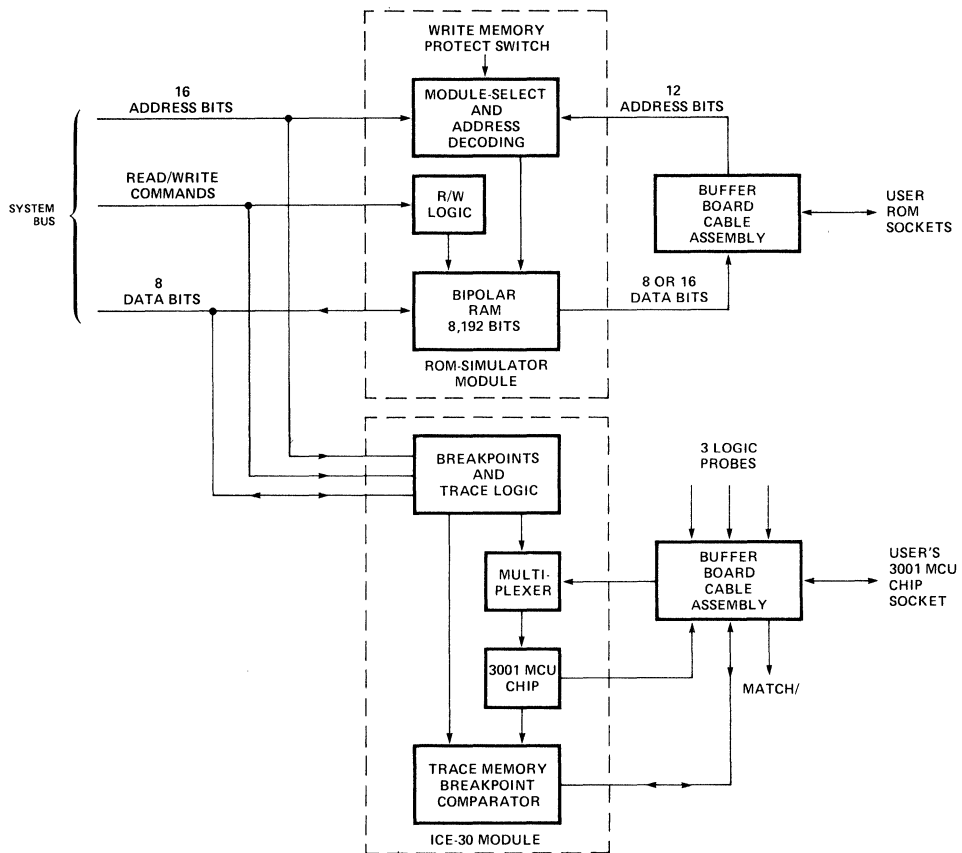
(Common to ICE30 and Optional ROM-SIM)

DISPLAY	Displays the contents of a specified address or address range in the simulated control storage.
BASE	Establishes a mode of display of all output data for the 'DISPLAY' command.
RESTART	Reinitializes all program variables, except the ROM-SIM configuration values, and starts execution at the point following the ROM-SIM configuration sequence.
EXIT	Causes ICE30SD to terminate.

ROM-SIM COMMANDS

ICE30SD provides commands necessary to drive the optional Intellec microprogram control storage simulation module, ROM-SIM. For a description of ROM-SIM capabilities, ask for the ROM-SIM Data Sheet #98-211A.

ICE30SD is written in Intel's high-level programming language PL/M and will execute in the minimum 16K RAM Intellec configuration.



FUNCTIONAL BLOCK DIAGRAM OF ICE-30 MODULE,
OPERATING IN CONJUNCTION WITH
ROM-SIMULATOR MODULE

SPECIFICATIONS

PHYSICAL CHARACTERISTICS

(Printed Circuit Board)

Width: 12.00 in.

Height: 6.75 in.

Depth: 0.50 in.

EQUIPMENT SUPPLIED

Printed Circuit Board

Interface Cables and

Buffer Enclosure Assembly

Reference Manual

Software Paper Tape

ORDERING INFORMATION

Part Number	Description
MDS-30-ICE	3000 Series In-Circuit Emulator